<u>Euler Drift Prime Conjectures</u>

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Basic function for a Euler Drift:

$$E(n,m) = \lfloor e^n \rfloor \pm m \text{ for } n \in \mathbb{N}$$

And where:

$$\lfloor e^n \rfloor \in \mathbb{N}_{odd} \Rightarrow m \in \mathbb{N}_{even}$$
$$\lfloor e^n \rfloor \in \mathbb{N}_{even} \Rightarrow m \in \mathbb{N}_{odd}$$

This is equivalent to sating that $\lfloor e^n \rfloor \in \mathbb{N}_{odd} \Rightarrow E(n,m) = \lceil e^n \rceil \pm m$. In other words, the value of $E(n,m)$ must always result in an odd number, so m is always of the opposite polarity to $\lfloor e^n \rfloor$ to ensure that this is the case.

A Euler Drift Prime, $E^n_{prime}(n,m)$, for n is achieved by finding lowest value of m for which:

$$E^n_{prime}(n,m) = \lfloor e^n \rfloor \pm m \ \in \mathbb{P}.$$

For example, if $n = 5, m = 1$, $E(5,1) = \lfloor e^5 \rfloor + 1 = 149 \in \mathbb{P}$.

Whilst greater values of m also satisfy the equation, since $m = 1$ is the lowest value that does so, it is to be considered the Drift Prime for $n = 5$. i.e. $E^5_{prime} = E(5,1) = 149$

Euler Drift Twin Primes occur when both values (positive and negative) of m result in prime numbers. i.e.:

$$\lfloor e^n \rfloor + m \ \in \mathbb{P} \ \wedge \lfloor e^n \rfloor - m \ \in \mathbb{P}$$

Three Conjectures

The first pair:

$$\exists ?\, x \in \mathbb{N}, : E^n_{prime}(n,m) \geq e^n \ \forall \ n \geq x$$
$$\exists ?\, x \in \mathbb{N}, : E^n_{prime}(n,m) \leq e^n \ \forall \ n \geq x$$

i.e., does there exist an x for which all further Euler Drift Primes are *above* or *below* the value of e^n. If not, then this would imply that the closest prime to $\lfloor e^n \rfloor$ always varies from $+m$ and $-m$.

The second conjecture is just as simple: is there an infinite number of Euler Drift Twin Prime? Put in other terms:

$$\exists ?\, x \in \mathbb{N}: \neg(\lfloor e^n \rfloor + m \ \in \mathbb{P} \ \wedge \lfloor e^n \rfloor - m \ \in \mathbb{P}) \forall \ n \geq x$$

That is, does there exist an x for which there are no twin primes for all n greater or equal to x. i.e.: the last twin Euler Drift Prime occurs at $E^{x-1}_{prime}(x-1,m)$.